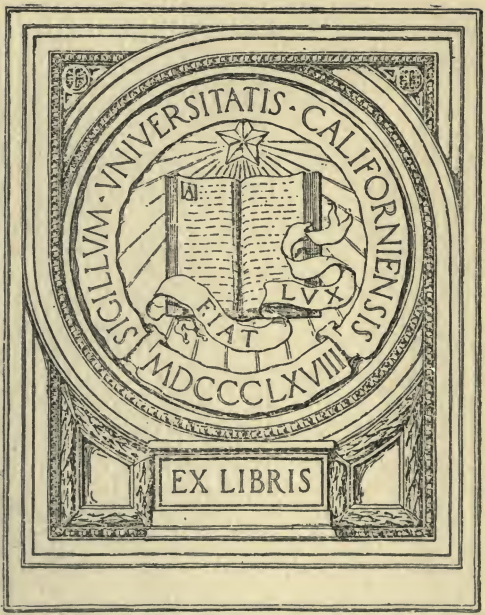
THE CAUSES OF HEART FAILURE

ROBEY


SIGILLVM · VNIVERSITATIS · CALIFORNIENSIS
LVX
FIAT
MDCCCLXVIII
EX LIBRIS

HARVARD HEALTH TALKS

THE CARE OF CHILDREN
BY JOHN LOVETT MORSE

PRESERVATIVES AND OTHER CHEMICALS IN FOODS: THEIR USE AND ABUSE
BY OTTO FOLIN

THE CARE OF THE SKIN
BY CHARLES JAMES WHITE

THE CARE OF THE SICK ROOM
BY ELBRIDGE GERRY CUTLER

THE CARE OF THE TEETH
BY CHARLES ALBERT BRACKETT

ADENOIDS AND TONSILS
BY ALGERNON COOLIDGE

AN ADEQUATE DIET
BY PERCY GOLDTHWAIT STILES

HOW TO AVOID INFECTION
BY CHARLES VALUE CHAPIN

PNEUMONIA
BY FREDERICK TAYLOR LORD

NEW GROWTHS AND CANCER
BY SIMEON BURT WOLBACH

THE CAUSES OF HEART FAILURE
BY WILLIAM HENRY ROBEY

HARVARD HEALTH TALKS

HARVARD HEALTH TALKS

THE CAUSES OF HEART FAILURE

BY

WILLIAM HENRY ROBEY
ASSISTANT PROFESSOR OF MEDICINE IN HARVARD UNIVERSITY
VISITING PHYSICIAN TO THE BOSTON CITY HOSPITAL

CAMBRIDGE
HARVARD UNIVERSITY PRESS
LONDON: HUMPHREY MILFORD
OXFORD UNIVERSITY PRESS
1922

HARVARD HEALTH TALKS

PRESENTING the substance of some of the public lectures delivered at the Medical School of Harvard University, this series aims to provide in easily accessible form modern and authoritative information on medical subjects of general importance. The following committee, composed of members of the Faculty of Medicine, has editorial supervision of the volumes published:

EDWARD HICKLING BRADFORD, A.M., M.D., Dean of the Faculty of Medicine, and Professor of Orthopedic Surgery, Emeritus.

HAROLD CLARENCE ERNST, A.M., M.D., Professor of Bacteriology.

WALTER BRADFORD CANNON, A.M., M.D., George Higginson Professor of Physiology.

THE CAUSES OF HEART FAILURE

THE CAUSES OF HEART FAILURE

SEVERAL years ago newspapers throughout the country amused themselves with jests about deaths from heart failure. They were not untimely, for it was obvious to the layman that in the last analysis the patient had died of heart failure. It was clear that if a man's heart stopped beating his life would cease, no matter what the underlying cause might be. It is, and always has been, quite unscientific for physicians to give "heart failure" as a cause of death. Many years ago registrars refused to accept from physicians a death certificate in which "heart failure" was given as the cause. In 1910 the Federal Government issued the *Physicians' Pocket Reference to the International List of Causes of Death*, on the flyleaf of which was the following

quotation from Dr. Charles V. Chapin, superintendent of health in Providence, Rhode Island: "The registration of vital statistics is the firm basis on which the whole structure of sanitary science and practice must rest. In order to learn the laws of disease, to devise remedies and test them, we must have approximately accurate knowledge of the movement of population and of the causes of death." In signing a death certificate the best trained physicians have not within the lifetime of many of us given such a meaningless cause. Notwithstanding all this, the term "heart failure" has remained in medical parlance where it has a perfectly good place if its significance is understood. To the mind of the intelligent physician the expression "heart failure" never means the death of the heart — that is too obvious. It means that the heart is failing to do its work and that brings us to the consideration of our subject — the causes which make

the heart fail. That is what Dr. Chapin meant when he said that in order to learn the laws of disease and to devise remedies we must have an approximately accurate knowledge of the causes of disease. If we are to prevent heart disease we must be alive to its causes and so greatly lessen the affections of this vital organ.

Structure and Mechanism of the Heart

Let us look for a moment at the heart and consider its structure and work. It is a somewhat conical body placed in the anterior portion of the thorax behind the sternum or breast bone, lying almost in the median line, rather more to the left than the right. Its apex hangs downward and backward and rests upon the diaphragm, the large muscular division which separates the thoracic from the abdominal cavity. Its base is at the third rib where it is held firmly in place and where the great veins enter and the

aorta is given off. The heart may be said to be in two main divisions which we speak of for convenience as the right and left heart. Each side is again divided into two parts, the auricle and ventricle. The right auricle receives the blood from the great veins, passes it through the right auricular-ventricular opening into the right ventricle from which its backward flow is prevented by the tricuspid valve. The right ventricle contracts and drives the blood through the pulmonary artery into the lungs and thence through the pulmonary veins into the left auricle from which it passes through the left auricular-ventricular opening into the left ventricle. When the left ventricle contracts, the blood is forced into the aorta and thence through the body. Its backward flow into the auricle, when the ventricle contracts, is prevented by the closure of the mitral valve. After the blood has entered the aorta, it is prevented from returning to the left ven-

tricle by the immediate closure of the aortic valves. This wonderfully adjusted piece of mechanism works in health with perfect regularity, the auricles contracting on the average 72 times per minute to be immediately followed by 72 contractions of the ventricles. Each auricular contraction is followed by a ventricular contraction in rhythmic sequence. The heart is a muscular organ and the thickness and strength of the walls of its chambers vary with the work required of them. Because it takes much more force to drive the blood through the body than through the lungs, the thickness and strength of the left ventricular wall is about four times greater than the right. Since it is a muscle, it must, like all other muscles, be nourished with blood and this is accomplished by the coronary or crown artery which is given off from the aorta and divides into two branches, one to the right and the other to the left. The two main branches again divide into

many smaller branches, the whole structure resembling a great tree. The heart is enclosed in a serous sack, the pericardium, the surfaces of which lie in apposition with about an ounce and a half of serum quite evenly distributed between the surfaces to act as a lubricant. All of the structures of the heart may be the seat of disease, singly or in varying combinations, the muscle (*myocarditis*), the valve and valve openings (*endocarditis*), the pericardium (*pericarditis*) and the coronary arteries (*coronary disease; arteriosclerosis*).

The heart muscle supplies the force which maintains the flow of blood through the lungs and through the body. In the normal circulatory mechanism all parts are so adjusted that the work of the heart is facilitated and any disturbance in any part of the heart or in other organs increases the work of efficiently maintaining the circulation and eventually leads to overwork and failure of the

heart. So long as the heart can overcome the effects of disease and maintain the circulation normally no symptoms are evoked, but when too great a strain is put upon it signs of fatigue and failure appear. No matter what the cause, the result is always embarrassment and finally exhaustion of the heart.

The Commonest Forms of Heart Disease

1. *The Arterio-Sclerotic Heart*

The arterio-sclerotic heart is sometimes spoken of as the "old-age heart." With hardening of the arteries throughout the body, the coronary arteries generally become involved, the circulation of the heart is impeded and the muscle undernourished. The person becomes breathless with any slight exertion, fatigues easily and may have pain in the region of the heart or a sensation of pressure about the root of the neck as though

the throat was compressed. The pain may shoot down the arm into the fingers or there may be tender points on pressure over the heart area. The occlusion of a large branch of the coronary artery is a frequent cause of sudden death in an old person. An old gentleman who had always been vigorous noticed that he became breathless with exertion and often had attacks of acute indigestion. He was treated by a physician for "stomach trouble" without relief. Upon examination evidences of a moderate degree of arterio-sclerosis were found with some increase in blood pressure. By limiting his activities and requiring him to take frequent rest periods his indigestion ceased and he felt as well as before. As chaplain of a Grand Army Post, he was impelled to conduct the funeral services of a comrade but the effort was too great, he collapsed and was carried home. A few days of rest made him feel as well as ever and he was advised to avoid emo-

tional as well as physical strain. Some two weeks later he became involved in an altercation with a man on his place, fell to the ground and died before the physician who was summoned could reach him. It should be remembered that emotional strain is often as great a factor in overtaxing the heart as physical work. The physician realizes this when he treats the overworried business man with angina pectoris.

The physician may be misled by the absence of any marked abnormal signs in the heart and circulation of a middle-aged or elderly individual. There will, however, usually be some found if the search is thorough. The history is of great importance.

Pain about the heart in the elderly should always be taken seriously and the patient's response to effort carefully studied. Persons of all ages may have pain which may or may not be due to cardiac disease. Children sometimes

suffer from pain in the cardiac area caused by overeating, indigestion or constipation. It may be due to valvular disease of the heart, such as mitral stenosis or aortic regurgitation. In the first instance a correction of the digestion and habits of eating will remove the symptom, while in the latter the physician recognizes it as one of the signs of structural damage resulting from some infectious disease. Certain nervous conditions such as neurocirculatory asthenia (effort syndrome; soldier's heart) cause heart pain. In this condition there is no organic disease of the heart. The excessive use of tobacco is another cause of pain known as "tobacco angina." Why it occurs in one person and not in another is unknown unless the theory that it attacks those with some underlying organic basis be tenable. Usually the cessation of tobacco for a few weeks will remove the pain.

Breathlessness coming on with any slight exertion is very important, especially if it occurs when the individual is sitting quietly or is awakened at night with a smothering sensation.

Fatigue in a person who states that his usual walk can no longer be taken without undue weariness should not be overlooked.

We do not ask the physician to take towards his patient the attitude of the illiterate police magistrate who summed up each case in this wise: "When I look at the prisoner in the dock, I says to myself, well, if he hadn't done something he wouldn't be there, so I finds him guilty," —but we do ask the physician to weigh the evidence carefully before beginning treatment. He must answer the question — can the patient "carry on"? Let me give two examples of what we mean by failure to "carry on." A patient, for thirty years a railroad engi-

neer, was accused by the legal department of sleeping in his cab between stations. He was taken from his engine immediately to the office of the medical examiner who found a very high blood pressure but practically no other signs. In three days of rest his pressure dropped to normal and in two or three weeks he was allowed to resume work but with the same result. Another and longer rest period was taken and he was then given a freight engine, possibly with the idea of greater safety, but all to no purpose. The man was highly indignant when demoted to a yard job, but three months later when entering the yard gate he fell dead. The heart and circulation could no longer stand the nervous strain of engine driving. Fortunately, the regular examination of engineers greatly eliminates this danger. A well nourished middle-aged business man had carried out the same routine for nearly thirty years. Every morning he walked about

two blocks up an incline to the street-car, but for two years had noticed that he could not do it without breathlessness. One morning he ran for his car, collapsed and was in his bed when he recovered consciousness. His physician could find very few signs of heart disease, but because of his history had urged a change in his mode of life. The patient absolutely refused to heed the warning and two weeks later had another collapse in which he died. This was the result of undue physical strain on a damaged heart.

2. *The Rheumatic Heart*

The rheumatic heart includes damage by rheumatic fever, chorea, tonsillitis, and scarlet fever. These diseases have the power of attacking all or any one of the structures of the heart. It is important for the physician to inspect the heart carefully during the course of the disease to discover the onset of lesions

which will later, if not guarded against, cause impairment. After an acute infection has ceased, it is necessary for the patient to be seen at regular intervals because there are some lesions which do not appear immediately. The heart may seem to be normal for a time, but later the evidence of damage presents itself. This is particularly true of the condition known as mitral stenosis — one of the greatest dangers of acute rheumatic fever in young people. Chorea or Saint Vitus Dance has often been classed and treated as an entity, but is, in the opinion of some of us, merely a part of the symptom complex of acute rheumatism. When present, even if unaccompanied by other signs, it should not be dismissed without a thorough search for foci of infection.

Since acute articular rheumatism (rheumatic fever) often causes heart disease and tonsillitis is frequently followed by rheumatism and cardiac disease, the im-

portance of removing diseased tonsils is evident. Not every person with enlarged tonsils requires tonsillectomy (removal by operation), but an operation should be performed if there are repeated attacks. Persons with rheumatism or rheumatic heart disease should have their tonsils thoroughly inspected by a competent laryngologist. In this way only can recurrences be prevented, the heart saved or additional damage avoided. The small "buried" tonsil is often more dangerous than the large one. Recently a new method of destroying the lymphoid tissue of the tonsil by the application of radium or the X-ray has come into use. The shrinking of the tonsil is quite marvelous even with one treatment, but time alone will prove the value of the procedure. Unless the method absolutely prevents re-infection it is useless and waiting is sometimes very dangerous.

Dr. Alexander Lambert of New York states that the number of cases of acute

rheumatism in the Bellevue Hospital has diminished in recent years and attributes this improvement to the care of the noses, throats, and teeth of the school children. In Boston, acute rheumatism is not the common disease it was twenty-five years ago.

Potential Heart Disease

Potential Heart Disease is a term which has been used recently and means that a person who has recurrences of any infection (tonsils, teeth, sore throats, rheumatism, etc.) is in danger of cardiac involvement. His heart may escape during the first and second infections, but with the third it may be involved. Hence the importance of removing the sources of danger before it is too late. A young girl has had two rather severe attacks of tonsillitis and as far as we can see the heart has not been affected. We have strongly urged the removal of the tonsils, but operation has been refused.

At any time a third attack may come and if heart disease should result we would all be regretful, but it would then be too late.

Pericarditis

Sometimes only the valves are affected, but often the valves, muscle, and pericardial sack are involved giving what is called a pancarditis. The recognition by the physician of the appearance of pericarditis during the course of an acute infection is of great importance, since it may be the only evidence at the time of a pancarditis and may warn the physician to search for other lesions then and later.

3. The Syphilitic Heart

The late Sir William Osler said, "It is to be remembered that syphilis is common in the community and there are probably more families with a luetic than a tubercular taint." This

is a sad commentary knowing as we do that syphilis is a preventable disease. Its effect upon the heart may be acute or chronic and its progress insidious. The parasite of syphilis attacks the heart muscle and more particularly the aorta and aortic valve. Regurgitation of blood through the aortic valve in a child is often the result of rheumatic infection, but in a middle-aged man it is frequently due to syphilis. Ten to twenty years after the initial lesion the syphilitic heart gives its first sign of distress, incapacitates the sufferer, and closes a life which should have seen twenty to thirty years more of usefulness. Much has been done to prevent syphilitic cardiac disease by early diagnosis of the initial lesion and prompt, thorough, and repeated treatments but, notwithstanding, some do not escape. Is it any wonder that the United States Public Health Service and other organizations are doing all in their power to

stamp out this menace by various educational methods ?

4. Other Infections

Pneumonia, typhoid fever, tuberculosis and certain obscure infections affect the cardiac structures, but this is chiefly a medical problem of interest during and immediately after the course of the disease.

5. Nervous Influences

Certain nervous disorders increase the cardiac rate as hyperthyroidism (goitre) and neurocirculatory asthenia (soldier's heart). This becomes important when the condition persists for a considerable period of time by fatiguing the overworked heart muscle.

6. Blood Pressure

Any condition which produces a constantly high blood pressure as in kidney disease or arterio-sclerosis.

7. The Athlete's Heart

We are often asked by anxious parents if school and college games injure the heart. The experience of those who have seen large numbers of college athletes is that even strenuous exercise rarely injures the heart, provided the athlete begins with a normal heart and is gradually trained. The collapse at the end of a contest is more often nervous than muscular.

Irregularities of Heart Action

Children often have normally an irregular action of the heart known as "sinus arrhythmia." It will be noticed when the child breathes deeply or cries that the pulse becomes irregular yet he can play without undue fatigue. There is no lack of cardiac response to effort. All other irregularities have, with certain exceptions, some pathological significance and should be thoroughly

investigated. Extra beats of the heart may occur at all ages and are not always important if inconstant. In old persons in apparently good health they are quite common.

Prevalence of Heart Disease

Heart disease has become a greater cause of death than tuberculosis. In New York for ten years it has been responsible for 200 deaths in every 100,000 of the population, while in 1920 tuberculosis caused 126 deaths in every 100,000. In 1919 the death rate from organic heart disease was 181 per 100,000 of the population of Massachusetts.

It is not a rapidly fatal condition as many people suppose, but one which usually means years of suffering and disability. Most of the sudden deaths occur in old people. Even when the end is unexpected, premonitory signs have frequently been present waiting for recognition. The economic waste from heart

disease in the United States is tremendous and therefore the great problem of prevention, early diagnosis, and relief appeals not only to physicians but to the general public. The crusade which has been going on for years against tuberculosis by various organizations, the instruction of patients in sanatoria and the appreciation of early diagnosis and proper protection against infection by physicians has made the disease so familiar to the country at large that the dreaded "Great White Plague" has steadily diminished. When the public realizes that heart disease is preventable by early recognition of its causes, a great step will have been taken in advance. The stress of modern life will continue to tax the circulatory system and old age will probably close in many instances with coronary disease, but this result can be greatly delayed by proper living and freedom from infectious diseases in early life. Our greatest hope is

for the children. Much has been written about treatment but more must be said and written about prevention. One of the largest fields today for preventive medicine is the instruction of the public in the importance of thoroughly understanding the causes of infections which involve the heart. For this purpose several large cities now have associations of physicians and laymen. Their meetings are open to all interested people and their transactions are reported in the daily press. In Boston there is the Association of Cardiac Clinics which holds meetings four times a year. The public schools have the throats and teeth of their pupils inspected. There is now an organized movement to carry instruction to all parts of the country.

Diagnosis

The diagnosis of heart disease can be made only after all methods of examination have been employed. The examina-

tion must be thorough and frequently repeated. The stethoscope, X-ray, blood pressure apparatus, polygraph, and electrocardiograph all contribute findings of varying importance in arriving at a final interpretation of the physical signs. No instrument of precision will give all the necessary information. A normal electrocardiogram, for example, would not convince the experienced physician of the absence of disease if other striking physical signs were present. In old people there may be very few objective symptoms but a history of pain, breathlessness, and undue fatigue will often aid in diagnosis.

Some years ago a great deal of attention was paid to heart murmurs, but later it was found that to be significant they must be associated with other physical findings. Children sometimes had murmurs which were unimportant, but as Sir James Mackenzie pointed out several years ago their activities were needlessly

limited. A career has been ruined because too much has been made of a meaningless murmur. A healthy child who can play as hard as his fellows without abnormal fatigue may generally have his murmur disregarded if other physical signs are absent. We have all seen people who have gone about for years in fear because at some period in their lives a murmur had been discovered. So the physician must be able to distinguish between functional and organic heart disease. Some forms of heart affections, as regurgitation at the aortic valve, may exist for years without giving subjective symptoms. Near the close of the World War the *British Medical Journal* reported the case of a captain of infantry who had seen active service at the front for three and a half years and was, in addition, the director of athletics in his area. This officer carried on during all that time with aortic regurgitation which was not discovered until his heart failed suddenly

and he was sent to the rear. Probably in the haste of mobilization his lesion was overlooked by the examining board.

Treatment

It is clear that prophylaxis and the recognition of potential heart disease come first by the removal of foci of infection such as diseased tonsils, the care and possible extraction of carious teeth, the X-ray examination by an expert of the teeth in doubtful cases especially the sealed or crowned tooth, the prevention of acute rheumatism and thorough protection against infectious diseases, the establishment of a proper diet with good digestion, and the best hygienic measures. While of the utmost importance in prevention their danger is not lessened by the detection of a heart lesion, because foci of infection if allowed to continue add to the damage. The prevalence of syphilis should be borne in mind and its detection in adults should

be made by the Wassermann test. The recognition of unsuspected syphilis may save a man from its serious cardiac sequelae in after years. Thorough routine physical examinations of apparently healthy people should be made at reasonable intervals. In this way latent causes and early circulatory diseases will be detected. We have our watches and automobiles regularly overhauled, but we allow our bodies to go until they break. The dentists have outstripped the physicians in this respect by insisting on regular inspection of the teeth. The dental patient receives notice of an appointment twice a year which he keeps knowing that the early recognition of decay will save his teeth, health, and money. Why do not all physicians have such an arrangement with their regular patients? Fortunately, the public is learning the importance of these precautionary examinations and is more and more demanding them. Some per-

sons derive great comfort by belonging to companies which examine the urine at stated intervals. Such an examination may or may not reveal the presence of kidney disease; it will very rarely disclose a damaged heart. An examination of the heart, however, will, if such exist, reveal cardiac abnormalities and may indicate the possibility of kidney involvement. An intelligent business man once told me with a good deal of satisfaction that he sent his urine twice a year to a laboratory and received reports for which he paid ten dollars. A young colleague thought well of the idea and they formed the plan of combining their urines in the same container and, incidentally, sharing the expense. When I asked him what he would do in the case of a positive finding, he blandly replied that each would seek his own physician to discover the source. Nothing can replace the complete physical examination. Recently the medical director of a

large insurance company informed me that 80 per cent of the rejected applicants have the causes of rejection discovered first by the medical examiner and not by their physicians as should be the case.

We have shown quite conclusively that the best method of treatment is to remove the cause of heart infection in the young and to delay circulatory degeneration in the old, but if disease is detected the medical treatment varies with the cause and degree of involvement.

Rest is the most important agent in the care of all forms of heart disease and satisfying sleep must be secured. In acute heart disease absolute rest in bed is imperative during and for a considerable period after the attack. Children are frequently kept in bed for weeks and months until the infection has completely subsided and the heart muscle has recovered its power. In the acute

stage the patient should not be allowed to make any exertion and should be assisted even when turning in bed. Straining at stool should be avoided by the use of suitable cathartics. The diet should be light and easily digestible. In the febrile stage the farinaceous diet is best. Enough water should be given to relieve thirst and insure a reasonable urinary output. An icebag over the precordia, while it probably has no effect upon the disease, often gives comfort. It should be very light otherwise a burden is added to a laboring chest. The patient is assisted in breathing by reclining upon several pillows.

Drugs in the acute stage are indicated by the character of the infection. Sleep may be secured by various hypnotics such as the bromides and veronal. Codeine and morphia are perhaps the best for quieting the heart and giving sleep in the more severe cases.

CAUSES OF HEART FAILURE

Chronic Heart Disease

Certain forms and conditions of chronic heart disease do not require medication but merely a sensible direction of the patient's life. All sources of possible local infection should be treated such as diseased tonsils, adenoids, pyorrhea, and infected teeth. Discretion must be used, however, in estimating the importance of these conditions. Cardiac patients must be careful about head colds and attacks of bronchitis, and such intercurrent affections should be treated with dispatch and thoroughness since they tend to throw added work on the heart.

If the physician has assured himself that the patient has organic heart disease he should secure his coöperation by a simple and tactful explanation of the true nature of the condition. The patient may be temporarily disturbed by the information, but he will quickly ad-

just himself to it and will thereby add greatly to his life and comfort.

Exercise. Muscular work increases the heart rate and raises the blood pressure, but it also improves the circulation. Moderate physical exercise gives a greater supply of fresh air, increases the pulmonary expansion, benefits the digestion, and causes a healthier action of the skin, thereby improving the circulation and the general health. It is difficult to control the activity of children, but by watching the effect of reasonable exercise and not exaggerating the dangers of occasional excesses they will be in better condition physically than those who become nervous and apprehensive by constant repression. Games which require hard physical work should not be allowed.

In adult life the same rules obtain. Walking, riding, and light games may all be indulged in provided they do not produce the signs of cardiac overwork.

Occupations which give ordinary exercise need not be changed. A sedentary life results in poor pulmonary expansion and defective digestion. Rough manual labor or work producing great fatigue should be abandoned.

Diet. The diet should be plain and composed of articles which are known to be easily digested. The meals should be taken regularly and eating between meals avoided. The weight should be watched and the diet regulated accordingly. Overweight, especially when due to fat, throws more work on the heart muscle. Moderation in all things must be the rule in cardiac disease. Constipation should be carefully avoided.

Drugs. In chronic cardiac affections, digitalis in its various forms is our greatest aid. In many early cases it is unnecessary. When, in suitable cases, digitalis fails it may be due to a poor preparation, insufficient dosage or a too

advanced stage of the disease. In recent years much effort has been made to secure potent digitalis and the physician should be careful to obtain a reliable preparation. He must watch its action and regulate the amount accordingly. It acts by slowing and strengthening the heart. The circulation is improved and dropsy, when present, relieved. Several years ago it was discovered that quinin could occasionally abolish an absolute irregularity of the heart action, and its use in the form of quinidin sulphate has added an important drug to the list of cardiac remedies. It cannot be used with the same ease as digitalis but only in carefully selected cases under close and competent observation. Since gross irregularity of the heart is a common sequel of several of its diseased conditions, it is obvious that any drug which will restore normal rhythm is of great value. It is necessary, however, that further study should be given by physi-

cians before the drug passes into common use, and it is quite possible that this stage will never be reached, but will be limited to certain cases which the cardiologist considers favorable. The various hypnotics are useful as already stated, and morphia is of great help to the chronic cardiac patient with marked failure of the heart muscle.

In the anginal type of heart disease nitroglycerin and sodium nitrite are valuable agents. Pearls of amyl nitrite should be carried by the patient to relieve an attack of angina pectoris.

The patient with any form of recognized heart disease should not attempt to regulate the management of his case, but should consult his physician at regular intervals. The appearance of any symptom which he does not understand should be the signal for medical advice.

In conclusion let me emphasize the following points:

1. Since disease is best managed in its incipiency, the value of routine physical examinations is obvious. Even when the individual supposes that he is in perfect health, signs of disease may be evident to the physician and the proper treatment instituted.
2. Early recognition means early treatment in which the proper management of the patient's mode of living is of more value than drugs. Furthermore, the removal of other diseased conditions will often prevent added injury to the heart.
3. Many cases of heart disease begin in childhood and youth due to foci of infection and the early eradication of these causes will save many lives. Thorough protection against infectious diseases is very essential.
4. The public should fully realize the important part which venereal disease, especially syphilis, plays in the causation of cardiac disease.

5. In the majority of cases heart disease does not cause sudden death but means years of inactivity and suffering. Apart from this the economic waste is tremendous.
6. The responsibility for the diffusion of knowledge concerning the causes and prevention of heart disease rests with physicians and other qualified persons who by individual instruction and public lectures should awaken the community to the means of decreasing unnecessary suffering and disability.

PRINTED AT
THE HARVARD UNIVERSITY PRESS
CAMBRIDGE, MASS., U. S. A.